

Science Fair Competition Generates Excitement and Promotes Creative Thinking in Japan

By

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Abstract

Educators in the U.S. and Japan have developed an international program to promote creative thinking in science. Their program includes a science fair component. This paper (which has been presented in both the U.S. and Japan) discusses creativity and describes a science fair activity, that the authors recently carried out in Japan. The special program in creative education is sponsored by the Northern New York Section of the American Chemical Society and by Suzuka National College of Technology in Japan.

Introduction

Science educators in the U.S. and Japan have initiated an international program in Creative Education. The main goals of the project are to turn children onto science and engineering and to develop critical thinking and creative problem-solving skills. This unique program includes the preparation and use of innovative teaching tools and techniques. It is sponsored by the Northern New York section of the American Chemical Society and by Suzuka National College of Technology in Japan. This paper stresses the importance of creativity and creative thinking. It also describes a science fair activity recently carried out in Japan. Since science fairs are relatively new to the country of Japan, the students thoroughly enjoyed the event. To promote the science fair teaching approach (a component of the program in Creative Education), the authors prepared a special book about science fairs for use in Japan. The book is written in Japanese and published by Gendai Tosho of Japan. A similar book was prepared for use in the United States. This paper has been presented (2005 & 2006) in the United States and Japan.

Creative Thinking

A brief discussion of creativity and creative thinking is included to give a better understanding of the program in Creative Education. Creativity has been important to humans since the beginning of time. It impacts our personal, social, economic, and cultural wellbeing. Creativity provides us with entertainment and is used by commercial organizations to develop and promote unique products. It occurs everywhere. Creative thinkers are able to produce original work and ideas. Also they combine existing objects and ideas to create something new. For example, the person who put a motor and a bike together made a motorbike, which eventually led to the motorcycle. A creative thinker is able to transform his/her unique gifts, talents, imagination, and vision into new and useful items, ideas, and solutions to problems.

The role of teachers is to promote creative thinking and encourage students to express innovative ideas. This teaching technique prepares the younger generation to think for themselves, and to solve new and challenging problems in our ever changing world.

It should be mentioned that in Japanese Society the typical classroom teachers are conservative and prefer the traditional lecture and chalkboard approach to learning. The course syllabi are rigid, predetermined, and strongly influenced by the central government's educational policies. The Country promotes a society living in harmony. Therefore, in the past the Japanese educators have not encouraged creativity in the classroom. Teachers in Japan have just recently started to use Science Fair competition to promote creative thinking and to make science fun. The authors used their innovative book (title in English: *Science Fair Fun in Japan*) to carry out Science Fairs in Japan for Japanese Coin Competition. Highlights of these exciting events aired on the TV News in Tsu City, Japan. This activity is described in detail and a modified one is proposed for use in the United States.

Japanese Coin Competition

This activity took place in Elementary School classrooms in Japan. The participants (who were 10 year old students) had 90 minutes to complete the entire project. Each student worked with a partner or in a group of 3. Every group was assigned a number. Half of the groups were provided with a 5 yen and a 50 yen coin. The remaining groups were given a 10 yen and a 100 yen coin. The purpose of the activity was for the students to determine which of their 2 coins held the most drops of water on its surface, and to creatively display their results.

Each group made and recorded a hypothesis before beginning the experiment. In addition to the 2 coins, they were provided with a paper cup half filled with water, a pipet, paper towels, writing paper, a data chart, graph paper, rulers, and a compass. To start, each student practiced making uniform drops using the pipet. Then each group member selected one of the coins and performed 3 trials of placing water droplets on the coin's surface. The same surface was tested each time and the coin was dried before each trial. Drops were counted until water rolled off of the coin. All data was recorded on the data chart.

DATA CHART

Trial	Coin 1	Coin 2
(number)	(drops of water)	(drops of water)
1.		
2.		
3.		

Each group had a choice to prepare either unique bar, circle, or line graphs of their results. Then they created an attractive poster of their work using large sheets of white paper, magic markers, crayons, rulers, tape, and other items made available to them. The posters included the following information: (group number, a catchy title, a statement of the problem, hypothesis, procedure, data table, graphs, and conclusions). Finally, the posters were displayed and evaluated by the judges. In addition, the students orally answered the judges' questions. (See the Judge's Evaluation form.) First and Second Place Award Certificates were presented to members of the groups obtaining the highest and second highest scores. Also each student received a Certificate of Participation.

JUDGE'S EVALUATION FORM

Judge: _____

Group Number: _____

Final Score (Total Points): _____

Problem (10 points)

points awarded: ____

Hypothesis (10 points)

points awarded: ____

Procedure (10 points)

points awarded: ____

Data Table (10 points)

points awarded: ____

Graphs (20 points)

points awarded: ____

Conclusions (10 points)

points awarded: ____

Oral Presentation (10 points)

points awarded: ____

Display –appearance/creativity, etc. (20 points)

points awarded: ____

Modified Activity: Students in the United States could carry out the Science Fair Coin Competition activity in the same way as the Japanese students. However, half of them would use a penny and a dime, while the remaining students would use a nickel and a quarter. (Coins from other Countries may also be used.)



Students display their creative posters.

Conclusion

The science fair teaching approach provided the Japanese children with enjoyable and productive learning experiences in science. It also gave them an opportunity to design and display their creative posters. The students at Kitarissei Elementary School in Japan were asked (in the form of a survey) if they liked the Science Fair Event. The results showed that out of the School's 40 participants, 98% of them enjoyed it very much. In addition, the parents, teachers, principals, and members of the media were impressed with the great event, which aired on TV News in Tsu City, Japan.

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